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## A Note on the Treatment of Liver Rot of Cattle with Carbon Tetrachloride.

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Each of the writers has had some experience of liver rot in cattle, and has come to recognise this disease as the cause of greater loss among young bovines than is generally supposed. They have known several outbreaks in which even 50 % of herds, varying in size from six to twenty-five individuals, have died. The very considerable condemnation of bovine livers at city abattoirs is a serious direct loss, and also an index of a less obvious, yet much more disastrous, wastage.

The treatment of the disease in cattle has been in an unsatisfactory position. In the writers' hands "Danistol" has given encouraging results, but it does not meet the need, demanded by these days of agricultural depression, for an efficient and inexpensive mode of treatment. Norris (2) has reported good results following his use of liquid extract of male fern, but observations made in Wales have not given this drug such a high place. Opportunity has been taken to test the efficiency of dosage with carbon tetrachloride.

Only observations made jointly are here reported. One of the writers, R.F.M., had made some observations on the toxicity of carbon tetrachloride to bovines and on the value of this drug in the treatment of young cattle affected with liver rot. Hall and Shillinger (1) in one of their early articles mentioned instances in which cattle had shown little tolerance to the drug. In North Wales it was found that while a dose of 100 c.c. was perfectly tolerated by one two-year-old, others, on a different farm, died following the administration of this dose. The symptoms and *post-mortem* lesions seen in these latter cases were believed to be typical of "carbon tetrachloride poisoning," and will be reported later. Norris (3) has seen toxic symptoms after the administration, to fluke infested cattle, of doses as small as 2 c.c.; these were transient and followed by complete and even rapid recovery. In experiments by R.F.M. dosage with 15 c.c. proved efficient treatment for affected eighteen months old cattle without producing serious toxic symptoms in these subjects.

Between the 19th October, 1927, and the date of writing (13/3/28) young cattle affected with liver rot have been treated with carbon tetrachloride. Of this number two have since died, and the circumstances associated with their deaths are recorded below. Detail concerning only the first five groups dosed—34 animals—is reported here because the observations on these groups are more complete. The progress of the other cases indicates that equally good results are being obtained. All these patients were fasted for some 15 hours previous to dosage, but in the case of some of the weaker animals this was not necessary, since they were eating little during the days previous to dosage. Pure carbon tetrachloride was administered in soft gelatine capsules, and the writers are indebted to Messrs. Parke, Davis and Co. for making and donating a sufficient supply of suitable capsules each containing 5 c.c. of the drug.

Group No. 1.

*Subjects.* Five young cattle, aged between nine and eleven months.

*History.* They were removed from "dangerous" pastures to their winter quarters on the 20th September, and thereafter given 2 lbs. per head each day of a mixture of fattening meal and Indian meal with damped chaff, and a liberal allowance of hay. Loss of condition had been noticed before these cattle were taken indoors, and became very marked despite liberal feeding.

*Observations.*

10/10/27. Seen by one of us (T.H.J.) they were in very poor condition, slow in their movements, and weak. They stood about in an utterly dejected manner, their appetite had become capricious, and they were reported to be sinking fast. They were affected with parasitic bronchitis. Examination of samples of fæces taken on this day showed that each calf was passing many nematode ova and larvæ, and a small number of liver fluke eggs was seen in each case. It was decided to dose the animals one at a time, taking the weakest first.

19/10/27. No. 1 was given 5 c.c. of carbon tetrachloride. About ten hours after dosage it appeared more dull, drowsy, and off its food. By the twenty-fourth hour it was normal.

20/10/27. No. 2 was given 5 c.c. and showed similar symptoms.

21/10/27. No. 3 given 5 c.c. with similar effect.

22/10/27. Nos. 4 and 5 given 6 c.c. and 7 c.c. respectively, and showed no toxic effects. All five received an intratracheal injection for husk.

1/11/27. During the ten days following dosage much improvement was noted; the appetite improved, general appearance of good health returned and the calves even frisked around their yard. Symptoms of husk practically disappeared.

18/11/27. Very marked clinical improvement was seen, and a sample of fæces obtained from each. A much reduced number of nematode ova and larvæ was found in each sample, but eggs of the liver fluke could only be detected in the fæces from No. 5, in number much too small to be estimated. This finding, with the history of the cases, suggested that all the mature flukes had been destroyed but that immature forms present at the time of dosage had escaped destruction. A further sample was to be obtained about two weeks later, but did not come to hand, and the calves were not seen until December 21st.

21/12/27. A letter from the owner stated that he believed that no useful purpose was likely to follow the examination of further samples or any further treatment since all the calves were rapidly losing ground, and some likely to die within a few days. A visit revealed a remarkable state of affairs. All had wasted to an almost unbelievable degree, were extremely weak, could only walk with difficulty, and made no attempt to move when approached. Their eyes were sunken and their appetite almost in abeyance. Those which were lying had to be assisted to their feet and even steadied before they could stand alone. Each, and particularly No. 5, seemed within a day or two of death and quite hopeless cases. 5 c.c. of carbon tetrachloride was administered to each, and samples of fæces taken. Fluke ova were present in numbers much larger than before treatment was commenced.

Few nematode eggs were seen. The immediate effect of dosage was strange since, in contrast to what followed the first dose, the three weakest calves showed no toxic symptoms, while slight toxic effects, drowsiness and incoordination, were seen in the case of the two stronger calves.

15/1/28. The beneficial effect of the second dose was very striking. Some improvement could be detected even two days after dosage, and each day saw such advance that at this date a strong farm hand had much difficulty in restraining even the poorest calf for examination.

7/2/28. On examination of further samples, ova of the liver fluke were detected in very small numbers in each with the exception of that from No. 3. The clinical condition of these calves was so much improved that further dosage was delayed another week.

15/2/28. 5 c.c. was given to each calf. Each showed evidence of toxic effect and in particular loss of appetite during the four days following dosage.

10/3/28. Each of these calves had continued to improve and appeared quite healthy. Ova of the liver fluke could not be detected in any sample taken on this date.

The following table gives the results of the fæcal examinations relating to the observations made on this group of young cattle:—

*Group No. 1.*

Dosed, 19/10/27.
Re-dosed, 21/12/27 and 15/2/28.

| Calf No. | 10/10/27 | 18/11/27 | 21/12/27 | 7/3/28 | 10/3/28 |
|---|---|---|---|---|---|
| 1 | xxx | Nil | 100 | 33 | Nil |
| 2 | xxx | Nil | 200 | 33 | Nil |
| 3 | 100 | Nil | 100 | Nil | Nil |
| 4 | xxx | Nil | 33 | 66 | Nil |
| 5 | xxx | x | 100 | 33 | Nil |

NOTE. Figures give number of fluke ova found, per gramme of natural fæces. x and xxx indicate ova present in numbers less than 33 per gramme.

GROUP NO. 2.

*Subjects.* Six young cattle, aged between eight and eleven months.

*History.* Grazing during the day, these calves were house-fed, and given a liberal allowance of hay each evening. They had been losing condition for some two weeks previous to first observation and, although stronger calves than those of Group No. 1, the owner, having heard of the experiments with his neighbour's young stock, and suspecting that his were similarly affected, offered his calves for observation.

*Observations.*

13/12/27. Ova of the liver fluke were found in the samples from each of these calves except those numbered 4 and 6.

20/12/27. Each of the calves had lost condition and become weaker during the previous week. Nos. 1 and 2 had 5 c.c. of carbon tetrachloride. No toxic effects were seen.

24/12/27. The remaining four were dosed, each receiving 10 c.c. They were the stronger calves, but some eight hours after dosage were dull, and disinclined to eat. Twenty-four hours later they appeared perfectly normal. From this date all were given, in addition to hay, 1 lb. of crushed oats and feeding meal. They improved much during the following three weeks.

19/1/28. Fluke ova were not seen in any sample taken on this date except in that from No. 1. Only a very few eggs were detected. All the calves were now in much better condition.

27/1/28. Examination of further samples showed that each calf except Nos. 2 and 4 were passing ova. Despite this observation the clinical condition of the subjects was so much improved that re-dosage was delayed a further three weeks.

15/2/28. Nos. 1 and 2 were given 5 c.c. and each of the other four 7 c.c. No toxic effects were seen.

10/3/28. At this date each of these calves appeared to be perfectly healthy. No fluke ova were seen in any of the samples obtained on this date.

GROUP NO. 3.

*Subjects.* Eleven young cattle, aged between seven and eleven months.

*History.* At pasture and receiving only hay previous to first observation, these calves thereafter were given concentrates in addition to hay. They had wasted very rapidly.

*Observations.*

9/1/28. Samples of fæces obtained on this date contained very many ova of the liver fluke. The numbers found, per gramme of natural fæces, were: No. 1, 266; No. 2, 233; No. 3, 33; No. 4, 66; No. 5, 200.

No. 1 was in a shocking condition; very weak and unable to rise, its mucous membranes were quite pallid, temperature 104.2, appetite very capricious and rumination in abeyance. It was given 3 c.c. and 2 c.c. on the following day, neither dose being followed by toxic symptoms.

No. 2 and No. 3, although slightly stronger, were very weak, and exhibited similar symptoms. Each had 5 c.c. and were diarrhœic from the second to the fifth day following dosage.

No. 4 showed no ill effects following the administration of 6 c.c.

No. 5 was stronger and received 10 c.c. without ill effect.

Six other calves, still strong but rapidly losing condition, were believed to be similarly infested, and were given doses of carbon tetrachloride varying from 5 to 10 c.c. They showed no toxic effects and the further clinical observations cover these animals also.

27/1/28. Very considerable clinical improvement had taken place in each case. Even calf No. 1 was quite bright and feeding well. It moved about freely and scampered off on being approached. On examination ova were found only in samples from Nos. 1 and 3, the number of eggs seen being 166 and 33 respectively. The general improvement was so marked and continuous that, despite the knowledge that two of the calves were passing ova, re-dosage was delayed three weeks.

18/2/28. Nos. 1 to 4 each received 5 c.c.; No. 5 was given 7 c.c., and each of the others had from 5 to 7 c.c. No toxic effects were seen.

10/3/28. All the calves had improved to a very remarkable degree and each seemed quite healthy. Ova could not be found in the samples obtained on this date.

GROUP NO. 4.

*Subjects.* Nine young cattle, aged between seven and ten months.

*History.* Still at pasture during the day, these calves had ¾lb. crushed oats, 1¼lb. linseed cake, and a liberal allowance of hay each day. They lost condition very rapidly during the three weeks previous to first observation.

*Observations.*

19/1/28. Each beast appeared to be very seriously affected and some were almost moribund. Their condition and appearance was similar to that of the previous group. A sample from one, No. 3, contained 350 fluke ova per gramme.

21/1/28. Nos. 1 and 2, being small calves and very weak, received 3 c.c. on this date, followed by 2 c.c. on the following morning. Apart from being quite off their food on the night of the day of first dosage, and showing some diarrhœa during the following few days, no toxic effects were seen in these two cattle. Nos. 3, 4 and 5 were given 5 c.c., Nos. 6 and 7 had 8 c.c., and Nos. 8 and 9 received 10 c.c. None of these latter animals showed any toxic symptoms.

28/1/28. All these calves had definitely commenced to improve, the change being especially noticeable in those numbered 1, 2 and 3.

14/2/28. Samples of fæces from Nos. 1, 2 and 3 were examined and ova seen only in that from No. 3, in which they were present in very small numbers.

29/2/28. Continuous improvement had quite changed the appearance of these calves and re-dosage was postponed.

10/3/28. Samples of fæces from Nos. 1 and 2 were obtained. Ova of the liver fluke were found in each sample; the numbers being 33 and 166 per gramme respectively. It is quite impossible properly to describe the very remarkable improvement made by each of these calves, particularly those numbered 1, 2 and 3. In view of the presence of ova in their fæces it is intended to re-dose them at any early date.

GROUP No. 5.

*Subjects.* Three young cattle, aged between nine and eleven months.

*History.* Previous to first observation these calves were reported to have rapidly lost condition. They were at grass and given 1½ lbs. of crushed oats per head and a liberal allowance of hay in their night quarters.

*Observations.*

27/1/28. Each calf was in very poor condition and similar in almost every respect to those of the two previous observations. Fæces samples could only be obtained from Nos. 1 and 2. Examination indicated that these cattle were seriously infested with mature liver flukes; the number of ova found per gramme of fæces being, respectively 966 and 500.

No. 1 received 5 c.c. and each of the others 6 c.c. The two latter animals were dull and refused food on the evening of the day of dosage.

21/2/28. From the fifth day after dosage clinical change was evident, the appetite improved and rumination became regular. By this date these calves appeared to be in good health. They were bright, active, feeding and improving. Ova were not found in any sample taken on this day.

12/3/28. Continued improvement had produced a very remarkable alteration in the appearance in these three calves. Re-dosage has been delayed until the examination of further samples indicates if it will be necessary.

. . . . . .

Beyond the two cases which have died, each of the other ninety-three patients appears to be making an excellent recovery. Toxic effects, other than slight symptoms such as those reported, have not been observed. The dose of carbon tetrachloride employed has varied from 5 to 10 c.c. according to the age, size, and condition of the animal.

The first calf which died was extremely weak and unable to rise at the time of dosage. It was given 5 c.c. of carbon tetrachloride and that evening the owner, looking over the half-door of the box, saw the patient lying stretched out, legs and neck extended. He thought it had died and did not make a closer examination. Next morning the servant sent to bury the "carcase" found that the calf was still alive. It was given some gruel, and it rallied only to die two days later. No *post-mortem* examination was made, but the owner, who "opened" the carcase, failed to find flukes in the liver, which showed evidence of serious infestation.

The other case lost was a small calf obviously very seriously affected when dosed with 5 c.c. of carbon tetrachloride on the 9th of February. With the others dosed on this farm he made excellent progress during the two weeks after dosage. Later he began to show marked signs of husk and when seen on the 5th of March he was suffering acutely from parasitic bronchitis and appeared likely to die very soon. An intratracheal injection was given, but the calf died on the 7th of March—one month after dosage with carbon tetrachloride. A *post-mortem* examination was made. The cause of death was broncho-pneumonia due to parasitic invasion. The liver was much enlarged and showed the characteristic lesions of severe fluke infestation. Flukes could not be found in the greatly thickened bile ducts but a few, about half-an-inch in length, were recovered from the smaller ducts.

The recovery of other similar cases has been so very remarkable that the writers believe these two cases, particularly that first mentioned, could have been brought to a successful termination had they been given reasonable care and attention by their owners.

## DISCUSSION.

The object in publishing this incomplete record now is to make these observations known before the close of the season during which cases of liver rot in cattle are likely to be encountered.

It must be emphasised that the subjects of these observations were quite extreme cases. Each animal had grazed very "dangerous" pasture, undoubtedly become infested by a very large number of flukes and was a very advanced case of a more or less sub-acute type of liver rot.

During March and the following months more chronic cases are likely to be met. These frequently present even greater difficulty in diagnosis, for the clinical manifestations—chiefly, loss of condition followed by marked wasting and great weakness—are not characteristic. Yearlings and two-year-old cattle are most frequently affected. Adults, although often infested, relatively rarely show clinical symptoms. The "flukey eye," so characteristic of the disease in sheep, is seldom seen and œdema of the dewlap only in older cattle affected with a chronic type of liver rot. In advanced cases diarrhœa is usually marked.

The age of the patient, knowledge of previous outbreaks of liver rot on the farm, and of a wet summer and autumn may aid diagnosis, but the value of fæcal examination cannot be over-estimated. It should be noted, however, that ova are present in much smaller concentration than in the fæces of clinically affected sheep.

The known variation in the tolerance of cattle to carbon tetrachloride caused the writers to proceed with caution. One or two animals of the earlier groups were dosed as a test before the remainder were treated. Later this precaution was discarded because it appeared that the relatively small dosage found efficient was at least reasonably safe. It is noteworthy that some observations indicate that cattle tolerate carbon tetrachloride more poorly on re-dosage, and may even show a low tolerance to the drug if treated a third time.

No attempt has been made to determine the minimum efficient dose. The writers believe that a single administration of 5 c.c. of pure carbon tetrachloride, in capsule, will clear all mature flukes from the liver of yearling cattle. It may be advisable when the patient is a small weak calf under one year, to divide this dose, giving 2 c.c. and 3 c.c. on consecutive days. Cattle rising two years old have been efficiently treated by the administration of a dose varying from 7 to 10 c.c., and observations, not yet complete, suggest that the dose might even be reduced to 5 c.c.

When part of the infestation consists of immature flukes, re-dosage will be necessary, and should be determined on clinical grounds, aided by fæcal examination. Instances are recorded in which a second dose was essential and a third at least advisable. It should be pointed out that as the season advances necessity for re-dosage of cases then encountered will gradually disappear—all infesting flukes having matured.

Considering the very advanced stage of the disease the great majority of these 127 young cattle had reached by the date of treatment, it is remarkable that only two have

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## An Investigation into the Effect of Pasteurisation on the Bovine Tubercle Bacillus in Naturally-infected Tuberculous Milk.*

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The following investigation into the effect of pasteurisation on the tubercle bacillus was commenced in 1923, in order to ascertain whether the temperatures used in commercial pasteurisation are at all times sufficient to destroy the virulence of the tubercle bacillus in naturally-infected tuberculous milk, *i.e.*, milk as secreted by a cow suffering from tuberculosis of the udder.

Before this investigation was begun the results obtained by various workers on this problem showed wide differences both in time and temperature. Lists of these investigations which have been published from time to time show variations from 60° C. (140° F.) for 20 minutes reported by Rosenau in 1907, to 70° C. (158° F.) for 45 minutes reported by Woodhead in 1895, as necessary for the effective destruction of the tubercle bacillus in milk.

Since 1923 papers have been published recording the following results :—

(1) Campbell-Brown (1923, p. 317) found that by employing cultures of human and bovine tubercle bacilli 60° C. (140° F.) for 20 minutes was sufficient to render the contaminated milk innocuous. In a criticism of Delépine's experiments, Campbell-Brown suggests that Delépine's statement (1914, p. 41) that tubercle bacilli are not killed in 18 minutes at a temperature rising steadily from 60° C. to 94° C. (201·2° F.) cannot be relied upon to disprove Rosenau's belief that tubercle bacilli are killed in 20 minutes at 60° C. As the difference in time is only two minutes and the temperature in Delépine's experiments rose steadily from 60° C. to 94° C., the different results obtained by the two workers may be explained by the circumstance that Delépine used naturally infected milk whilst Rosenau used cultures.

(2) Cameron-Macaulay (1925, p. 297) used tuberculous sputum and ground-up tuberculous glands from condemned carcases and found that both the human and bovine varieties of tubercle bacilli in milk are destroyed by pasteurisation for 30 minutes at 62·7° C. to 65·5° C. (145° to 150° F.).

(3) Hermima Jenkins (1926, p. 273) carried out two experiments only, at 60° C. and 62·8° C. (145° F.) respectively for 30 minutes, using naturally-infected milk, and failed to produce tuberculosis within six weeks in inoculated guinea-pigs.

(*Continued from previous page.*)

died. The manner in which each of the other animals has responded to treatment with carbon tetrachloride has been very striking.

### REFERENCES.

(1) Hall and Shillinger: *Jnl. Agric. Res.*, Vol. xxiii, pp. 163-192.
(2) Norris: *Jnl. Dept. Lands and Agriculture*, Vol. xxv, pp. 155-206.
(3) Norris: *Vet. Record*, Vol. vii, No. 28, p. 598.

* Reprinted from *The Journal of Hygiene*, Vol. XXVI, No. 4, 18th October, 1927.

(4) R. G. White (1926, p. 222) inoculated thirty guinea-pigs with naturally-infected tuberculous milk heated at 62·5° C. (144·5° F.) for 30 minutes and reports one positive result which he explains in the following words: "It is possible that an accident may have occurred. The result, which proved to be the one exception in the tests, I am, therefore inclined to interpret in this light." In view of the experiments to be presently described I disagree with this statement. With regard to Dr. White's experiments, it is well to remember that a period of eight minutes was taken to raise the milk to the required temperature—the time taken for cooling the milk is not stated.

(5) C. W. Andersen (1924, p. 177) with an apparatus similar in principle to that used in the present investigation, found that by heating apparently normal milk from cows suffering from tuberculosis of the udder, one guinea-pig out of six injected with the centrifugalised deposit and cream of 20 c.c. of this milk, which had been heated at 63° C. (145·4° F.) for 30 minutes, developed generalised tuberculosis after three and a half months.

(6) In a publication on pasteurisation by American authors (*Public Health Bull.* No. 147, p. 121) tubercle bacilli were found to be destroyed at 59° C. (138° F.) for 30 minutes, 61·1° C. (142° F.) for 30 minutes, and 64·4° C. (148° F.) for 30 minutes; the latter three conclusions were based on the results of single experiments made on milk inoculated with cultures of tubercle bacilli.

The foregoing epitome of recent work on this subject shows that of the three workers who used naturally-infected milk in their experiments, two report positive results after heating at 62·5° C. to 63° C. (144·5° to 145·4° F.) for 30 minutes; the workers using material other than naturally-infected milk report that the tubercle bacillus is killed at temperatures of 62·8° C. (145° F.) for 30 minutes and 60° C. (140° F.) for 20 minutes respectively.

In the present series of experiments particular attention has been paid to the possibilities of "latent infection" described by Delépine (1916, p. 600) who states :—

From these results it would appear that the heated bacilli were at first barely capable of overcoming the resistance offered to them by the phagocytes in the region first infected, but that some bacilli had escaped and had been carried away probably by some of the migratory cells. These bacilli had been able to multiply and to regain their pathogenic power.

The facts observed seem also to indicate that the recuperation of this pathogenic power became more marked as the distance from the seat of inoculation increased, for, while the local lesions remained insignificant, those of distant organs were practically as extensive as those found in the animals inoculated with untreated milk.

With this possibility of latent infection in mind, the majority of the guinea-pigs inoculated with heated milk in the present investigation were kept until at least 100 days after inoculation, and in some cases the animals were kept 600 days.

The experiments now to be described record an attempt to reproduce in the laboratory the conditions under which milk is pasteurised commercially in the pocket type of pasteuriser, great care being taken to ensure that every particle of milk received the same amount of heat.

### EXPERIMENTAL ANIMALS.

The milk of three cows suffering from tuberculosis of the udder was used in this investigation.

Cow No. 1. Red Shorthorn cow "Rose." This cow was reported by a veterinary inspector as showing typical signs of tuberculosis of the udder. Tubercle bacilli were demonstrated in all four quarters. The milk was abnormal in appearance, a flocculent mass separating out on standing.

Cow No. 2. British Friesian cow "Dorothy." The milk from this cow had previously been proved to contain living tubercle bacilli. The clinical signs of disease were very slight. The right supramammary gland showed slight enlargement and the udder had a distinct hard swelling high up in the right hind quarter; all the other quarters were apparently normal. It was found by guinea-pig inoculation that both hind quarters were yielding tuberculous milk. The two fore quarters remained unaffected throughout the experiments. The milk remained normal in appearance during the whole of the time that this cow was used as an experimental animal.

Cow No. 3. Roan Shorthorn cow "Floss." During the whole of the time that this cow was used as an experimental animal her appearance was that of a typical milking cow and under ordinary circumstances she would without doubt have remained in the dairy herd.

[Experiments are detailed by the authors.—Ed.].

### Summaries of Series of Experiments.

*First Series.* A series of 39 experiments was made on the milk of three cows suffering from tuberculosis of the udder. The milk was in every case heated at 62,8° C. (145° F.) for 30 minutes.

Out of 118 guinea-pigs inoculated with the centrifugalised deposit and cream of the heated milk, one developed generalised tuberculosis; the remaining 117 gave negative results or died of non-tuberculous infection. The positive case (Guinea-pig M3) died 110 days after inoculation, the infection resembling that described by Delépine in his paper on "Latent Tuberculosis." The local lymphatic glands were only slightly involved, but the liver, spleen and lungs were the sites of an extensive infection.

Out of 38 guinea-pigs inoculated with coagulated material found on the cooler after pasteurisation one gave a positive result.

*Second Series.* Twenty-five experiments were made, heating apparently normal tuberculous milk at 60° C. (140° F.) for 30 minutes. One hundred guinea-pigs inoculated with the centrifugalised deposit and cream of the heated milk gave negative results or died of non-tuberculous infection.

*Third Series.* Seventeen experiments were made with naturally-infected tuberculous milk heated at 60° C. (140° F.) for 20 minutes. Out of 66 guinea-pigs inoculated with the centrifugalised deposit and cream of the pasteurised milk one developed tuberculosis, the remaining 65 gave negative results or died of non-tuberculous infections.

Three experiments were made in which coagulated material was found to be present on the cooler after pasteurisation. Out of six guinea-pigs inoculated with this coagulated material, one developed tuberculosis, the remaining five gave negative results or died of non-tuberculous infection.

Both of the positive results recorded in this series of experiments occurred towards the end of the lactation period of cow No. 3 when the milk was slightly abnormal.

*Fourth Series.* Three experiments were made by heating naturally-infected tuberculous milk at 59·3° C. (138·8° F.) for 20 minutes; out of twelve guinea-pigs inoculated with the centrifugalised deposit and cream of the heated milk ten developed tuberculosis.

Out of six guinea-pigs inoculated with coagulated material from the cooler after pasteurisation all six gave negative results or died of non-tuberculous infection.

### General Summary of Results.

The following table gives the results obtained with guinea-pigs inoculated with naturally-infected tuberculous milk after pasteurisation at various temperatures.

| Series | Treatment | Material inoculated | Guinea-pigs inoculated | − | + | Died of non-tuberculous infection in less than 100 days |
|---|---|---|---|---|---|---|
| I | 145° F. for 30 min. | Centrifugalised deposit and cream | 118 | 103 | 1 | 14 |
| I (*a*) | 145° F. for 30 min. | Coagulated material from cooler | 38 | 33 | 1 | 4 |
| II | 140° F. for 30 min. | Centrifugalised deposit and cream | 100 | 96 | 0 | 4 |
| III | 140° F. for 20 min. | Centrifugalised deposit and cream | 66 | 47 | 1 | 18 |
| III(*a*) | 140° F. for 20 min. | Coagulated material from cooler | 6 | 3 | 1 | 2 |
| IV | 138.8° F. for 20 min. | Centrifugalised deposit and cream | 12 | 0 | 10 | 2 |
| IV (*a*) | 138.8° F. for 20 min. | Coagulated material from cooler | 6 | 3 | 0 | 3 |

### Discussion.

Since the discovery of the tubercle bacillus by Koch there has been controversy regarding its thermal death point, particularly in milk.

Owing to some workers having tested the thermal death point of bacilli in naturally-infected material, whilst others used cultures of the bacilli, and that there have been variations in technique, it is necessary to exercise some caution when attempting to correlate the results.

Tubercle bacilli are not easily cultivated on artificial media and it is probable that artificial cultivation yields organisms which are less resistant to outside influences than those occurring naturally. Further, cultures of bacilli can have no such protective covering as is provided by cells and tissue in natural infection.

Therefore, results obtained with artificial cultures ought not to be accepted as criteria of those which would be obtained with naturally-infected milk.

In any biological experiments, numbers are of the greatest importance, because natural resistance to infection varies, sometimes very widely, from animal to animal. Conclusions should therefore be based only on numerous experiments.

In attempting to translate the results of experiments into practice it must be remembered that it is by no means always possible to exercise that strict control which obtains in the laboratory. An instance of this is found in the recent work of American investigators, who found that with pasteurisers in ordinary commercial use at the time of the experiments, tubercle bacilli survived heating at 62·8° C. (145° F.) for 30 minutes. With machines specially constructed this combination of time and temperature proved to be effective in destroying cultures of tubercle bacilli in milk. The failure of the original machines to kill the organisms is explained by leaky valves and faulty

construction which allowed some of the milk to escape exposure to the recorded temperature for the full period of time.

Further, the accuracy of the thermometers used to record the temperatures maintained during heating in commercial pasteurisation is one of great importance when the results of the author's experiments are considered. It was found that whilst at 140° F. the bacilli were usually destroyed, at 138·8° F. they survived on no less than ten out of twelve occasions, the exposure lasting 20 minutes in both cases. It is, therefore, evident that it is necessary to use standardised thermometers in commercial pasteurisation.

### Conclusions.

1. A temperature of 62·8° C. (145° F.) for 30 minutes does not invariably kill the tubercle bacillus in naturally-infected milk, although in most cases this temperature is effective.

2. At a temperature of 60° C. (140° F.) for 20 minutes tubercle bacilli are in many cases destroyed, but this combination of time and temperature leaves no margin of safety.

### Acknowledgments.

I am indebted to Prof. R. Stenhouse Williams, Mr. A. T. R. Mattick and to Mr. W. A. Hoy, of the National Institute for Research in Dairying, for their help and advice throughout this investigation.

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## Draught Horses in Towns.

"It has repeatedly been affirmed that the number of heavy draught horses employed in London has increased in recent years, but no definite statistics have been published," says the Agricultural correspondent of *The Times*. "Possibly Glasgow can be accepted as indicative of what is happening in London and elsewhere. I notice that in the Glasgow Corporation stables there are 337 Clydesdales, compared with 279 in 1919. Another point of importance is that the 46 geldings bought last year cost, on an average, £103 13s. 9d. The Glasgow Corporation not only favour horses, but they evidently believe in having in their stables the best procurable."

## Mortality Among Pit Ponies.

### Discussion in the House of Lords.

In the House of Lords on Wednesday, March 28th, Lord Danesfort asked the Government whether their attention had been called to the official statistics of mortality among pit ponies in Great Britain for the year 1925, being the last normal year for which statistics were available; whether the total number of animals employed underground in that year was 60,852, and the animals killed or destroyed by reason of accidents were 44 per 1,000, and the animals which died or were destroyed by reason of disease or old age were 36 per 1,000; whether the percentages of mortality from these causes in the Lancashire and North Wales divisions were far lower than the average percentages mentioned above; while the percentage of animals killed or destroyed by reason of accidents in the Yorkshire division was far higher than the average mentioned above; whether the attention of the Government had been drawn to a pamphlet issued by Mr. D. Jeffrey Williams, in 1927, which contained serious allegations as to the overworking of animals in some mines, and stated that there were cases of animals being worked ten, 12 and even 14 shifts in the week, and as many as 15 and 16 hours in one day, and what degree of truth was there in these statements; whether the number of inspectors in 1925 was eight for the inspection of over 60,000 animals in the eight mining divisions; whether the number of inspectors had since been increased, and whether notice of their visits was given to the managers of the mines; and what steps had been taken or were being taken to introduce mechanical haulage into the mines to replace animal haulage; and moved for papers.

He looked upon the substitution of mechanical haulage for animal haulage as the real remedy for the present state of things. In the case of new mines it might be possible to make mechanical haulage compulsory.

Lord Daryngton said that, although only eight inspectors were appointed *ad hoc*, there was a large number of men who were inspectors. No doubt at times there had been cases of cruelty, and he hoped that in every case in future there would, when possible, be a conviction. It was not a simple matter, however, to replace horse haulage entirely by mechanical haulage. It was not so difficult in new mines, but it was almost impossible to overcome the difficulty in old mines.

Lord Joicey said he did not think that much inspection was required in the large mines, because the organisation was so good. All the coalowners whom he knew were most anxious to get rid of the ponies and substitute mechanical haulage if possible.

Earl Stanhope, Civil Lord of the Admiralty, replying to the debate, said that 65,210 pit ponies were employed in 1924, 60,852 in 1925, and 56,852 in 1927. The numbers which died or were destroyed in consequence of disease or old age were 31 per 1,000 in 1924, 36 per 1,000 in 1925, and 28 per 1,000 in 1927. Ponies killed by accident numbered 47 per 1,000 in 1924, 44 per 1,000 in 1925, and 37 per 1,000 in 1927. Considering the nature of the work, it was felt that the deaths from disease and old age among ponies used in mines were not unduly high. As to accidents, the dangers inherent in the mining industry must necessarily affect the figures relating to animals as well as to human beings. Probably the main cause of accidents was to be found in falls from the roof. It accounted for nearly half the number of ponies actually injured by accident each year. The Ministry admitted that many of the accidents were preventible, and to these preventible causes the Department through the inspectorate was giving constant attention. It was to the interest of colliery-owners that the accident rate for ponies should be reduced to the lowest possible figure, and they were co-operating with the inspectors with this object. The figures for 1927 showed a considerable reduction in death-rates as the result of old-age and disease and of accident, and there was every reason to expect that that improvement would be retained and probably steadily increased.

In Lancashire, where only a little over 1,000 horses were employed, the number killed or destroyed by accident was in 1924, 23 per 1,000; 1925, 19; and 1927, 35. The figures relating to death from disease and old age were 29, 24 and 25. In Yorkshire there were some 8,100 ponies. The rate of accidents was a high one. It was 75 per thousand in 1924, 76 in 1925, and 65 in 1927. For animals destroyed for disease and old age, the figures were 29, 27, and 16 per 1,000. The main reason for the big difference between these two areas was that in

Lancashire the ponies were generally only employed in permanent roads some way back from the coal face; whilst in Yorkshire in many pits ponies were worked right under the coal face. The Ministry was not entirely satisfied with the position in Yorkshire, and special steps were being taken in that area to secure the co-operation of colliery managers in reducing accidents.

The Ministry was aware of the pamphlet of Mr. Jeffrey Williams, who was secretary of the Pit Pony Protection Society. The impression left by a study of two pamphlets issued was that those connected with the mines in managerial capacities or manual workers were a particularly inhumane class. That was entirely contrary to the case, and was a view which he emphatically repudiated on behalf of the Ministry. There had been gross cases of cruelty, and when they were discovered drastic action was taken, but the circulation of vague charges was not helpful either to the Ministry or the cause of bettering the conditions under which the ponies worked. The Government in 1924 appointed an independent veterinary surgeon to make a survey of the conditions, and he reported that the health, food and general conditions of the ponies compared favourably with that of horses on the surface. It was quite true that there were only eight horse inspectors to look after 26,800 ponies, but the other inspectors, of whom there were more than 100, also looked at the ponies. The Ministry did not feel justified in increasing the number of inspectors. As a general rule, the inspectors did not give notice of their visits. Mechanical haulage was impossible in many mines without very large expense, and in the present condition of the mining industry it would be quite impossible to impose heavy capital expenditure of that kind. Even in new mines it was not possible to make a general rule that mechanical haulage should be introduced, but the Ministry did its best to encourage mechanical haulage.

Lord Banbury said that the percentage of accidents seemed great. Could the Ministry not make a regulation laying it down that, where places were so difficult to work that accidents might occur, the ponies should not be worked, but that the haulage should be done by men?

Lord Arnold said the Government reply was disappointing in certain important respects. He thought that a *prima facie* case had been made out for more inspectors, and that it was not sufficient to reply that that would mean more officials and more cost.

Lord Danesfort, referring to the Pit Pony Protection Association, said that one pamphlet which was issued showed that in some mines the conditions were admirable. He thought that was indicative of a desire to give credit where credit was due. He believed the House would be grateful for the Government statement.

The motion was withdrawn.

NOTE ON EATAN LIQUEFIED FOOD.
(*As advertised in this issue*).

This Food is obtained from animal albumen, tissues and organs of oxen, by a new process of hydrolisation, whereby these nutritive substances are transformed into amino acids, now known to be the ultimate form of nutrition taken up by the cells.

It is a peculiarity of this Food that its merits are not only just based on its calorific, protein or vitamin feeding values, but rather on the important transformation to which such known foods have been subjected, and which really means that food is now made to enter the cells in spite of any individual defective working of the organism, weakness or inability to assimilate foods. It follows that new and additional stamina is thus positively conveyed to the organism.

Cumulative professional evidence testifies to the very satisfactory results obtained in general veterinary practice with this new Tonic Food in all forms of debility, digestive disorders, distemper, after operations, exhaustion, nervous troubles and during convalescence, etc. Being in liquid form, it is easily administered and the small dosage required makes it inexpensive in use.

# The Veterinary Record.

*7th April, 1928.*

## AN INSPIRING LEAD.

Within the period covered by the Spring meetings of the Divisions of the N.V.M.A. all attendant members will have had before them the letter recently sent down by the Editorial Committee soliciting their practical aid in the process of securing for *The Veterinary Record* an adequate supply of clinical material.

Issued in faith and in hope, this appeal will have failed in its purpose if it produces from a Division nothing more tangible than the silence which, though it may be said to indicate assent, yet leads to no collective or individual activity.

It is with very real gratification, therefore, that the Committee has received this week the following hearty response from a Scottish Division, and it has pleasure in giving it prominence as an expression of enthusiastic acceptance of the proposal to co-operate, and as one to be commended to the attention of every organisation affiliated to the "National." The letter, addressed to the Editorial Representative, is as follows:—

West of Scotland Division N.V.M.A.,
78 Crookston Street,
Glasgow.
26*th March*, 1928.

Dear Sir,—Your letter was read at the meeting of this Division held in Glasgow on Saturday, 24th inst. It was felt that there was a great deal of truth in your letter—that more clinical reports are desirable to make our journal, *The Veterinary Record*, of more interest and value to the general practitioner.

Our members, therefore, promise that they will, in future, give more attention to this matter and either send notes of interesting cases direct, or to me for forwarding to you.

Yours faithfully,
GEORGE W. WEIR,
*Hon. Secretary.*

### PERSONAL.

*Will.*—GARRY, Mr. Thomas Cozens, F.R.C.V.S. (65), of Spencer-park, Wandsworth, S.W. (net personalty £2,917), £7,647.

. . . . . .

*Will.*—PRINCE, Mr. Francis Thomas, M.R.C.V.S., of Ashbourne, Derby (net personality £11,713), £13,555.

# CLINICAL AND CASE REPORTS.

## Scottish Metropolitan Division Meeting Exhibits.

Following are descriptions of Exhibits made at a Meeting of the Scottish Metropolitan Division, N.V.M.A., held at the Royal (Dick) Veterinary College, Edinburgh, on 25th January, 1928.

### Urethral Calculus from Horse.

*(By J. Gibson, M.R.C.V.S., Dundee.)*

The history of the case was that the horse had shewn colicky symptoms at intervals, and pain when passing urine. When first seen the animal had all the appearances of having an ordinary obstructive colic. Rectal examination was not possible owing to the fractiousness and impatience of the horse at this time, but later it was carried out, and an obstruction of the urethra of unknown origin was diagnosed. Attempts to pass the catheter failed. The horse was cast and chloroformed, and the calculus was distinctly felt between the sphincter of the bladder and the sciatic arch.

It was decided to operate and attempt removal. An incision 6 inches long was made beneath the anus into the urethra, which was catheterised, and it was found possible with the hand in the rectum to propel the calculus through the incision. The wound was packed with gauze and sutured. On the next day, urine was found trickling through the wound, and in three days the stitches were removed. The horse did well for a week. Then a large swelling appeared in the inguinal region, the horse became stiff, and its temperature rose. The swelling was lanced and a considerable amount of pus escaped, after which recovery was uninterrupted. The wound healed up except for a small opening about the size of the index finger, which remained patent for the rest of the horse's life.

Two years after the operation the animal succumbed to purpura, after having worked regularly in the intermediate time. It micturated through the opening, but upon each occasion the penis was somewhat protruded, and the usual attitude of the male when passing water was assumed. On *post-mortem* the cavity in which the calculus rested was still easily discernible, although it was not so large as previously.

The calculus weighed 3½ lbs. upon removal, and at present weighs 3 lbs.—the difference being due to the evaporation of moisture. It is roughly ovoid, with the broad end measuring 5 inches across its widest portion. Its length is 6¼ inches.

The case was remarkable in that during what must have been some months, while the calculus was forming, the horse did not suffer any inconvenience until the enormous size recorded was reached.

### Urethral Calculi from Bull.

*(By J. Gibson, M.R.C.V.S., Dundee.)*

These calculi were taken from the bladder and urethra of a two-and-a-half-year-old, very fat, Shorthorn bull. He had met with several of these cases, which were not uncommon in heavy feeding districts. He performed practically the same operation as in the horse just described, but the bull was not cast. He used cocaine anæsthesia. What struck him most was the extreme depth of the urethra, which was buried in layers of fat. The wound was somewhat troublesome, but ultimately did heal. Unfortunately the hind limbs and the scrotum became greatly soiled and eventually scalded by the escaping urine, and the bull had to be killed.

On *post-mortem* further calculi were found. The largest of those shewn were taken from the urethra at the sigmoid flexure of the penis; the medium-sized ones were from the bladder, and the smallest were found embedded in the left kidney. He considered that the operation was not likely to be successful in male bovines because of the tendency for the calculi to be multiple.

He would like to mention that he was indebted to Mr. A. Spruell, of Dundee, for assistance with both of these cases, and as Mr. Spruell was present perhaps he would amplify what he had already said.

#### Discussion.

Mr. A. Spruell (Dundee) said he was pleased to have been associated with Mr. Gibson in connection with these two cases. He had been called to see the bull, and found that there was severe strangury, and that small sloughs and gravel were being passed in the urine. The bull was impotent and useless for breeding, but it was insured, and the Insurance Company desired operation. He also was astonished at the extreme depth of the urethra in this bull—quite 6 inches below the level of the skin.

So far as the horse was concerned, the operation was entirely justified and quite successful, for the animal had worked steadily from the time of operation until its death two years later.

He had once done quite a lot of urethral operating, and after operation used to pass a brass tube with a rubber covering into the urethra, which was held in place by elastic bands, to keep the wound open and facilitate passage of urine. The tubes were removed once weekly, and the wound cleansed. Such things were not, of course, now required, since the operation could be performed quite successfully by simply leaving the wound to heal in the usual way.

Professor W. M. Mitchell said he was greatly interested to hear Mr. Gibson's account of these operations. He could not understand why in the horse there was usually only one calculus, but in cattle it was more usual to find that there were several occurring in various positions between the kidney and the penis. He agreed with Mr. Gibson that if there was an obstruction in a breeding bull from a calculus it was not worth while operating, because calculi were usually multiple and a further obstruction was almost certain to occur. Generally, the urinary obstruction resulted from a calculus becoming fixed in the urethra at the posterior part of the sigmoid flexure of the penis, and in a breeding bull to get at that site required an incision of such depth that it was impossible to raise the penis to the surface to remove the calculus satisfactorily.

Mr. J. Henderson (Broughton) mentioned that he had removed a calculus from the urethra of a dog, and had subsequently sutured the wound. He found that the dog attacked the sutures with its teeth and tore them out. Thereafter, the wound was left to heal as an open wound, and did quite well.

Mr. W. Anderson (Pittenweem) asked Mr. Gibson what happened to the urethra in the penis below the site of the operation. Did it become stenosed?

Mr. Gibson said he was not sure, but certainly the urine was passed by the operation wound and not in the usual way, although during micturition the penis was protruded.

Mr. J. Spruell stated that he would like to say a little more about urethral calculi in the dog, in view of Mr. Henderson's comment. He remembered removing cystic calculi in three bitches (two Pekinese and an Irish terrier) by the supra-pubic method, and in one case the dog tore

out the stitches, with the result that there was a trickling of urine. The wounds, however, healed quite successfully, indicating that urine did not necessarily induce suppuration in a wound, or retard healing ; this bitch was still fit and alive. An interesting point about the Irish terrier was that there was a recurrence of a large single calculus three months after the first operation. The owner, however, declined a second operation on economic grounds. The operation was performed in that animal during pregnancy, mainly because it was feared that parturition might be difficult. She gave birth to a litter safely before the recurrence of the calculus in three months.

Professor MITCHELL said he was of the opinion that in the dog a recurrence of calculus formation was likely after removal. He knew of one dog in which there had been no recurrence for three years, however, the owner taking great pains to ensure that the dog received a sufficiency of water, and sodium thiobromine being given regularly to promote diuresis. In that case the calculi removed were of the small angular, multiple type.

The PRESIDENT (Prof. R. G. Linton) stated that he would expect a recurrence of calculus formation because it was to be assumed that the original cause still remained active after operation. He also expressed astonishment at the enormous size of the calculus from the horse's urethra, and wondered how it was that an animal could live for so long with such an obstruction in its urethra.

### SPLINTERED FRACTURE OF THIRD PHALANX OF HORSE, INVOLVING THE SHEATH OF THE DEEP FLEXOR TENDON.

*(By Professor W. M. Mitchell, M.C., B.Sc., M.R.C.V.S.)*

This specimen was the foot of a heavy draught horse, which was prepared in layers to demonstrate how the various tissues had been affected as the result of a punctured wound caused by a 3 inch screw nail.

HISTORY. On *December 1st* the horse, while at work, picked up a 3 inch rusty screw nail which penetrated the near hind foot in the outer lateral cleft of the frog about 1 inch behind the apex. The nail was immediately extracted. The owner poulticed and tubbed the foot for a fortnight without calling in professional advice, when, as the horse was still lame, Prof. Mitchell's colleague, Mr. Miller, attended the case.

*December 15th.* The track of the nail was opened by Mr. Miller down to the matrix, but very little underrunning of frog or sole was found for about ½ inch radius around the site of puncture of the matrix. The case improved under local antiseptic wet dressings.

*December 29th.* All discharge from the sinus in the soft tissues having ceased, the horse went to exercise.

*December 30th.* The horse was reported to be very lame.

*December 31st.* When seen on this day the horse had great difficulty in moving, being very loath to put any weight on the foot, and examination of the foot showed no discharge, although the position of the original sinus was still evident. The animal was floated into hospital with a view to operation, as it was obvious that some infective focus had recently become active.

*January 1st.* OPERATION. Under general anæsthesia, after thinning the horn down still farther around the already breached sole and frog, a probe was passed along the track of the sinus, and was felt to strike bone.

A conical piece of the soft tissues was removed around the sinus, exposing a small cavity close to the third phalanx containing a little blood-stained serum, and a small sequestrum of bone was easily lifted away from the bone with dissecting forceps. The position of the sequestrum was close up to the semi-lunar crest, but there was no obvious necrosis of the insertion of the deep flexor tendon, so it was decided to proceed no farther.

A light shoe was fitted so as to permit of an iron sole being used to keep in place a wet antiseptic gauze dressing of acriflavine (1 : 1000).

*January 2nd.* The horse was very lame, but on removal of the dressings no appreciable amount of discharge was visible. The horse was put into slings.

*January 3rd.* General toxic symptoms were noticed, and a free flow of synovial discharge soaked the dressings on removal. It was decided to operate on the following day with the intention of doing a complete re-section of the deep flexor tendon.

*January 4th.* The horse was exhausted and had to be lowered to the ground, so no operation could, under the circumstances, be performed, and the horse was therefore destroyed.

*Post-mortem Examination.* The specimen shewed no definite pus formation anywhere. Leading from the position where the sequestrum had been extracted at operation, a fine probe could be passed into the sheath at the semi-lunar crest. The sheath of the deep flexor tendon contained an unusual quantity of slightly blood-stained synovia with, in places, a certain amount of shaggy lymph deposit. The distal inter-phalangeal articulation also showed increased synovial secretion, but there was no direct communication from the exterior.

#### DISCUSSION.

At the time of injury the nail had apparently penetrated deeply and caused a splintered fracture without any displacement. Not until infection had spread along the line of granulation tissue which developed in the crack in the bone and led to necrosis of this, with subsequent loosening of the splinter forming a sequestrum, did infection reach the sheath of the deep flexor tendon.

This occurred, Professor Mitchell thought, on December 30th, when the horse went lame after exercise, *i.e.*, four weeks after the injury. The fracture extended just to the margin of the sheath at the semi-lunar crest, and the removal of the sequestrum left an exit from which the copious flow of synovia escaped from the recently infected and acutely inflamed sheath.

### X-RAY PHOTOGRAPHS.

*(By Professor W. M. Mitchell, M.C., B.Sc., M.R.C.V.S.)*

1. Fracture of neck of femur of dog ;
2. Anterior dislocation of hip joint of dog ;
3. Foot of horse (described above) taken after death with probe *in situ* entering the sheath of the deep flexor.

Professor MITCHELL, in showing Nos. 1 and 2, stressed the necessity of differentiating between these two fairly common causes of hip lameness in the dog—dislocations of the joint being most frequently overlooked. Even without an X-ray photograph, careful comparison of the injured side with the normal was often sufficient to clinch the diagnosis, taking into consideration the following three anatomical landmarks : (*a*) Iliac crest ; (*b*) Great trochanter of the femur ; (*c*) Sciatic tuber ; even though there was no crepitus as was occasionally the case in No. 1.

The depression between the sciatic tuber and the great trochanter normally allowed a finger to be laid in it ; this depression, in dislocation forward, was increased in size,

and if the dislocation is backward (more rare) was diminished.

In fracture of the neck of the femur the relative positions of the landmarks were not greatly altered, the change here being a more marked prominence of the trochanter from drawing up of the femur.

The photograph of the horse's foot was shewn merely as an example of the high standard of clearness which could now be attained of the bones of the foot, the detail of the spongy bone of the third phalanx being very distinct in spite of the horn of the hoof.

### Healed Fractures of the Tibia of the Horse.

(*By Professor W. M. Mitchell, M.C., B.Sc., M.R.C.V.S.*)

1. Specimen of a fracture of the tibia, with the following history :—A local dealer bought a horse seven years of age, for shipment to the Continent, which was said to have had the tibia fractured when the animal was a foal. The horse had been working regularly up to the time of sale. There was definite angulation about the centre of the shaft of the bone, and the horse had an awkward gait from the deformity. The animal, not being fit for shipment, was destroyed at the Zoo, and the specimen was received from there.

The angulation was well marked, and the bone was much heavier than normal from dense sclerosis in the region of the fracture, there having been apparently little displacement of the parts at the time, forming merely a bending of the bone.

2. The second specimen was from Mr. Lothian, M.R.C.V.S., of Duns, who had been called to the case shortly after an accident, and found the tibia fractured. Treatment was proceeding, and the fracture was healing satisfactorily, when, unfortunately the horse died from another cause entirely unconnected with the fracture. In this specimen there was a very considerable deposition of periosteal bone around the shaft of the tibia both near the fracture and at some distance from it.

*Hodgkin's Disease* (?) From Mr. G. A. M. Harle, M.R.C.V.S., Coldstream, were received a number of enlarged glands illustrating Hodgkin's disease. They were from a Mastiff bitch. Practically all the superficial lymph glands were greatly enlarged, some of the specimens measuring 3 to 4 inches in diameter. The specimens had not, at the date of the meeting, been histologically examined.

Organic Disease of Horse's Heart. Mr. Harle had also sent a specimen of a portion of the lower part of a valve from a horse's heart. There was an enlargement about the size of a marble, ½ inch in diameter, firmly attached to the base of the valve. There was no history available (Mr. Harle not being at the meeting) beyond the fact that the specimen was taken during the course of a *post-mortem* examination on a three-year-old thoroughbred filly. The naked-eye appearance of this on section was that of a chronic inspissated abscess.

Professor Mitchell stated that it was his opinion that organic disease of the heart of the horse was rare, basing this upon the examination of hearts of old horses slaughtered for food at the Zoological Gardens, and that the common heart trouble met with in the horse was of a functional nature.

### Hairball from Rumen.

(*By Mr. P. Wilson, M.R.C.V.S., Lanark.*)

Upon this hairball, which had been vomited by a cow, there was a deposit of lime salts. For some weeks previously the animal had been affected by chronic tympany of the rumen of a most persistent nature. Treatment proved unsatisfactory, but one morning the specimen was found in the trough in front of the cow, showing distinct signs of tooth marks upon it, and having obviously been regurgitated from the rumen. Its present size was about 2 inches in diameter, but when fresh it was quite twice this size.

The opinion was expressed by a member that it must have lain in the œsophageal groove or in a diverticulum of the œsophagus rather than in the rumen, but Mr. Wilson pointed out that if it had lain in a diverticulum in the œsophagus the animal could not have swallowed straw, for his experience went to show that whenever there was a diverticulum in the œsophagus, straw, when swallowed, became packed into the diverticulum after a short while, giving rise to symptoms of choking, attempts to vomit, and then, when the collected material had been expelled, immediate relief. In such cases rumination did occur, but was irregular and abnormal.

In this particular case the animal was able to feed normally between the periods when it exhibited tympany of the rumen, and rumination had occurred regularly and with no abnormality in these periods.

His opinion was that the concretion must have lain in the rumen, and that it was got rid of by vomiting—being chewed by the teeth on its passage through the mouth.

### From Department of Pathology, R.(D.)V.C.

The following Exhibits illustrating some phases of the work of the Department of Pathology were on view.

**Poultry Diseases.**

*Bacillary White Diarrhœa of Chicks.*

- Specimen of an affected chick.
- Cultures of *Meta-salmonella pullora.*
- Biochemical tests for the organism.
- Microscopical preparations of the organism.
- Battery of tubes showing a positive and a negative agglutination test.
- Apparatus for the collection of blood samples.
- Preparation showing the correct place for the collection of blood from the fowl.

**Milk under The Tuberculosis Order.**

- Sample of tuberculous milk.
- Film of tuberculous milk showing the organisms.
- Tuberculous guinea-pigs showing the distribution of the lesions following subcutaneous inoculation.
- Film from lesion of tuberculous guinea-pig showing organisms.
- Cultures of *Mycobacterium tuberculosis bovis.*
- Apparatus for milk examination.

**Botryomycosis.**

- Section from the shoulder-tumour of a horse showing organisms.
- Section from lesion in the hollow of the heel of a horse showing organisms.

VERMINOUS PNEUMONIA.
(Lung-worm Disease).

Specimens of lungs affected with the disease.

Microscopical preparations showing :—

(i) the living parasite ;
(ii) the parasite in the lung tissue ;
(iii) the histological changes in the lung tissue ;
(iv) gangrenous pneumonia. This exhibit was in further illustration of some remarks made by Professor Matheson at an earlier meeting on "Pneumonia in Ewes," which may form the subject of a further communication.

FOOD SAMPLES.

The PRESIDENT (Prof. R. G. Linton) showed a sample of prepared seaweed sent on by Mr. J. G. McGregor, County Veterinary Officer, Stirling. Prepared seaweed had, he said, for some time been recognised as a valuable supplementary food, the beneficial effects which followed its use being attributable to its mineral content, and probably in particular to the iodine it contained. It was reported that it had given good results when fed to debilitated horses, and to be of particular value as a preventive of lymphangitis. The President also showed a sample of whale meat which, as the members would probably know, was rather extensively used at the present time as a source of protein for poultry and pigs in particular.

## Proof of Lamb Slaughtering Against a Dog.

By H. TUDOR HUGHES, F.R.C.V.S., Oswestry.

A cross-bred Irish terrier was seen devouring a freshly-killed lamb, at about 11-45 a.m., and three other lambs were found killed, but not eaten. The farmer fired a shot gun at long range, and scared the dog away, but tenaciously followed him home to a neighbouring village.

An urgent telephone message was received from the farmer wanting an immediate visit to test the dog. On arrival the situation and history of events were explained by the farmer, who was in attendance with the bodies of the four lambs in his float, and insisted on the dog being made to vomit so as to bring forth the blood of the lamb as evidence of his guilt.

It was explained that by then the blood would probably have been digested, but that the devoured lamb had a great portion of the back parts, including one hind quarter, and portion of head of femur, missing, and of such a sumptious feast of flesh the stomach of the dog which had eaten it would still contain a large quantity. With the consent of the owner of the dog (rather a savage one) an injection of gr. ii of morphine sulphate was administered, for want of anything better immediately available.

In five minutes the dog was sick profusely twice, the time now being 3-15 p.m., and about three and a half hours after the lamb was seen being devoured. The vomit was placed in a large enamel bowl and washed with cold water.

On close examination the contents of the bowl disclosed a large quantity (about an ordinary pudding basinful) of recently ingested and but slightly digested raw flesh, including a portion of small intestine, matching that exposed in the carcase of the lamb, except for being paler from partial digestion, together with the head of the femur and a semi-lunar cartilage from the stifle, as well as some locks of wool.

The evidence against the dog was considered complete, so an injection of H.C.N. was given forthwith, and terms of compensation amicably settled for the four lambs.

## An Infectious Disease of Bovines.

By O. STINSON, M.R.C.V.S., Appleby.

The following is a summary of cases met with by me at the same time as those detailed under the heading "Infectious Pneumonia of Adult Bovines," by Messrs. S. E. Sampson and W. Tweed, in the *Record* of March 24th, as presented by them to the North Midland Division. There is no doubt that this is a disease of more than ordinary interest and importance, especially as it is not dealt with in the text-books.

This condition occurred on six farms during the last week of November and first week of December, 1927. It attacked cattle of all ages, from 90 to 100 per cent. of the animals under the same roof susceptible, contracting the trouble. It has been encountered in other years, but not to the same extent. In one case an animal in another building became affected.

*Incubation period.*—Usually about two days, but on rare occasions it appeared to be as long as ten days.

*Symptoms.*—The symptoms varied, but certain types could be recognised. (1) General Febrile type. (2) Respiratory. (3) Arthritic.

1. *General febrile type.*—Onset abrupt, coryza (bronchial catarrh common). Conjunctivitis. Temperature between 104.5°F. and 107°F., lasting from three to five days. Pulse increased. Râles observed in lungs. Commonest type.

2. *Respiratory type.*—Pneumonia. Symptoms of lobar pneumonia. Accounted for two deaths, these being the only fatal cases. Death took place within three days. This type was met with on all the affected farms.

3. *Arthritic type.*—Fever and uneasiness, with loss of appetite ; later, difficulty in rising on account of obvious pain in a joint or joints. In one case a stifle was affected and tremendously enlarged—this patient had to be assisted to rise. Rarest type and was evident on a third of the farms.

NOTE.—The trouble is met with only during the late autumn or early winter and all the farms become affected within a week. The weather at the time is changeable, with some fog. The farms are widely separated, which puts out of question infection from one farm to another. A specific organism appears to be a necessary factor.

## Treatment of Fits.

By H. T. RYAN, F.R.C.V.S., Cork.

In the report of the meeting of the Royal Counties Division of the N.V.M.A., as reported in the *Veterinary Record* dated 3rd March, Mr. J. Willett advocates swinging dogs by the hind legs as a cure for paralysis.

I was rather interested in this report, as I have already been doing much the same thing, only the operation was

reversed, the disease different, and the cure temporary. I refer to fits brought on by worms in the intestinal tract of puppies.

The first dog I tried it on was a Collie, four months old, which, when food was given, immediately developed a fit. The first symptom was a raising of the head and champing of the jaws, followed in a few seconds by falling down. The animal would remain in a fit for a few minutes and then gradually recover, but would be dull for half an hour or so. Other fits would follow at varying intervals, but one could always be produced by giving the animal food.

If, when the jaws begin to champ, the animal is raised by the elbows and swung backwards and forwards between one's legs or sideways for about half a minute, the fit immediately stops. This is such a simple treatment that it is probably very old, but I have never heard of it or seen it in print. I have only had an opportunity of trying it on three cases, but as it was successful with me in these cases, I thought it might prove interesting to others.

This is the only way I know of for quickly stopping such fits, but of course the result is only temporary, as a vermicide brings about a cure.

### Methylated Spirits Poisoning.

By T. F. PRIME, M.R.C.V.S., Upper Norwood.

A three-months-old puppy, being shut in a room by himself, and finding it very lonely, amused himself by chewing up into small pieces a block of Spiritine, with the result that when his owner found him about an hour afterwards, he was slobbering from the mouth, had a stupid, dazed look, and a rolling gait. About half an hour afterwards he was brought to the surgery, moaning and whining; also there was considerable twitching of the legs.

I gave a rather heavy dose of bromide of potash, and the Rough-haired terrier pup was violently sick about ten minutes afterwards. The twitching of the limbs and fear of being touched continued for some hours, the puppy crying out violently when touched or lifted, and snapping at one. This entirely disappeared during the night, and owing to doses of bromide he had a fairly good night with the exception of moaning a little. The next day he was quite himself again, although still smelling of methylated spirits of wine.

## PERSONAL.

*Marriage.* SEARLES—WILKS. At Abingdon, Berks., on the 14th March, Geoffrey William Searles, M.R.C.V.S., of West Street, Alresford, only son of Major and Mrs. Percy Searles, of Margate, to Joan, only daughter of Mr. and Mrs. W. Wilks, of Abingdon, Berks.

## ARMY VETERINARY SERVICE.

LONDON GAZETTE. WAR OFFICE. REGULAR ARMY.

March 30th.—Major S. F. G. Pallin, D.S.O., is placed on the h.p. list on account of ill-health (March 31st).

TERRITORIAL ARMY.

Lt. H. W. Brekke to be Capt. with precedence as from Dec. 4, 1927 (Feb. 29th); William Tweed to be Lt. (March 31st).

# REPORT.

### Annual Administration Report of the Army Veterinary Service in India, 1925-26.

The numerical strength in animals of the Army in India, including remount depôts, is considerably in advance of the Army at Home, and for the year under review comprises the following:—horses, 35,115; mules, 35,750; camels, 5,105; cattle, 5,346; donkeys, 234; elephants, 1.

Speaking generally, excepting in respect to ulcer bursatti in horses (a disease depending greatly on climatic conditions) and digestive diseases in camels, chiefly relating to colic and peritonitis, there is shown a reduced incidence of ordinary disease on the previous year. Admissions for peritonitis in camels were the direct results of castration, the operation in old animals always being attended with a certain amount of risk. To reduce this risk it is proposed "to employ the clamp and iron (no ligature) and the after treatment to consist of washing out the operation wounds with either the cold water hosepipe or with a solution of an antiseptic applied by means of the Reid's pump. By these methods manipulation is reduced to a minimum." Ligature is considered "of use when castrating camels in a state of musht or when dealing with those with varicose vessels."

Of contagious and specific diseases it is interesting to note the prevalence of contagious abortion in military dairy farms (20 cases, as compared to 69 last year) and abortions in the donkey stud at Mona remount depôt (30 cases). No marked progress in the prevention, either in bovines or equines, seems to have been made. No cases of epizootic lymphangitis were recorded during the year—a very satisfactory circumstance. On the other hand, a considerable increase in glanders is reported, *viz.*, 30 cases as compared with 19 in the previous year. Twenty of the cases were revealed by mallein testing, 10 of which were amongst officers' private chargers stabled in private stables and under no obligation to be tested unless occupying Government stables. It has now been ruled that, before drawing syce and forage allowance, pay bills must be endorsed with a mallein certificate.

In April 1925, an outbreak of Johne's disease occurred amongst the working bullocks at Mona remount depôt, 69 cases being discovered by test, of which six died. Those obviously sick and debilitated were destroyed, and the balance of the reactors were placed in working isolation. In the following February a re-test of 451 bullocks was made, and all reactors were continued in working isolation.

During the year, 1,406 cattle were inoculated by the serum-simultaneous method against rinderpest. In connection with this system of double inoculation, report would appear to show that natural rinderpest has occurred in animals so inoculated at various dates during the years 1920-24, notably in an outbreak at the Military Dairy Farm, Kirkee, where out of 41 animals attacked in February-March, 1925, 18 had been inoculated by the serum-simultaneous method in 1922 and one in 1923, and of these 14 died. The matter is so vitally important to the successful employment of this method of preventive inoculation that it is necessary to quote the explanation and experience of the Director of the Imperial Institute of Veterinary Research, Muktesar, to whom the matter

was referred. He reports as follows :—" The explanation of the apparent breakdown furnished at the time (*i.e.*, the outbreak at the Military Dairy Farm, Kirkee) was that the virulent blood used in the method of inoculation had most probably become inert, so that in reality the animals had never undergone the desired mild or symptomless attack of rinderpest necessary for the development of an active immunity.

" Tests upon the duration of immunity conferred after the serum-simultaneous inoculation elsewhere in the world, and notably in Egypt, have indicated that the protected animals are immune to virulent infection for periods extending to ten years after the inoculation. Hence we have always assumed that the immunity conferred is a life-long one.

" However, in recent years we have carried out a series of prolonged experiments at Muktesar to obtain direct evidence upon this subject of the duration of protection after the serum-simultaneous inoculation, and we have found that in the case of calves subjected to the method there is sometimes a very noticeable falling off in the degree of protection after an interval of about thirty months, particularly when the reaction to the inoculation was entirely ' blocked out.' Work in this connection is still in progress."

Strangles would appear to have been unusually severe in remount depôts during the year, particularly at Mona and Sargodha, the percentage of young stock purchased which became affected being 76.17 per cent. as compared to 47 per cent. last year. Preventive vaccination was carried out at Mona and Sargodha, but with no better results than in previous years, whether such was by preventive serum, pyo-vaccination, or by a serum-simultaneous method.

The Cross method of treatment for surra in camels was continued as a routine measure, 441 cases being reported cured. The process has been found to be of no avail in equine surra ; indeed, for the latter disease no specific up to date has been found which could be of practical value in the field. J.M.

### Atropin-Morphin Treatment of Laminitis.

Since more than a year ago our Italian colleagues have been employing massive intramuscular injections of atropin and morphin in the treatment of acute laminitis (*La Clinica Veterinaria*, May, 1926) with results that appear to be startling. No other treatment is employed. Neutral atropin sulphate and hydrochlorate of morphin are the particular salts recommended. They are mixed in the proportion of one part of the atropin salt to four of the morphin in enough warm, sterile water to make the solution 1 per cent. of morphin. The prescription would read :—

| | |
|---|---|
| Atropin sulphate ... | 0.25 gram (3.75 grains). |
| Morphin hydrochlorate | 1.00 gram (15 grains). |
| Water ... ... | 100.00 grams (3½ ounces). |

The dose of the horse is from five to six drams injected intramuscularly for two successive days after twenty-four hours of fasting. The reaction from the injection is intense during the four hours following, but recedes without harm and in four days the foundered subject is cured, according to the information we have obtained. The same treatment is recommended for acute lameness of rheumatic origin. (*The North American Veterinarian*, October, 1927).

# DIVISIONAL REPORTS.

## Scottish Metropolitan Division.*

### Annual Meeting at Edinburgh.

The Annual Meeting of the above Division was held in the Royal (Dick) Veterinary College on Wednesday, 25th January, at 2-30 p.m. The President (Professor R. G. Linton) occupied the Chair.

Prior to the meeting a Meeting of Council was held, during which time members had an opportunity to examine a considerable number of fresh and dried specimens, demonstrations of which formed the subject of the meeting.

The following gentlemen were present :—

*Members.* The President, Messrs. A. Spruell, J. Gibson, Wm. Anderson, S. Robson, H. F. Downie, Dr. O. Charnock Bradley, Prof. W. A. Pool, and Mr. A. Brownlee, Prof. W. M. Mitchell, Prof. D. C. Matheson, Messrs. P. Fisher, P. Wilson, Jas. Henderson, John Taylor, T. M. Inglis, J. Ker, J. Aitken, and the Hon. Secretary (Mr. W. C. Miller). *Visitors* : Mr. Esmond Brown, Ministry's Divisional Inspector ; Major Graham Williamson, R.A.V.C. ; Mr. A. Larnach and Mr. A. Fulton, together with a number of Final Year students.

The *Minutes* of the last meeting, having been printed in the *Veterinary Record*, were taken as read, approved and signed. The Secretary intimated that apologies had been received from the following members : Messrs. A. Gofton, W. Wallace Peggie, E. J. H. Sewell, John Brown, Major A. Baird, Messrs. W. Nairn, H. Begg, Prof. J. Russell Greig, Messrs. J. G. McGregor, W. Lothian, and G. F. Boddie.

A letter was read from the Secretary of the N.V.M.A. referring to the desirability of close organisation of veterinary inspectors throughout the country. The President intimated that the letter had been considered by the Council and they recommended :—

" That a Veterinary Officers' Section of the Scottish Metropolitan Division be formed, membership of which is to be open to both ' whole-time ' and ' part-time ' veterinary officers ; and that meetings be held so far as possible in conjunction with the ordinary meetings of the Division."

Dr. O. Charnock Bradley moved that this recommendation be adopted, and Mr. J. Taylor seconded. After discussion, the motion was put and carried unanimously.

A letter was read from the Secretary of the N.V.M.A., forwarded from the Secretary of the Scottish Branch, which contained a resolution adopted by the Council of the N.V.M.A. that :—

" The Council of the N.V.M.A. has every sympathy with all efforts made to further humanity to animals, and that it feels sure that all members of the profession will, on all occasions where necessary, render assistance at reduced fees in deserving cases."

This, together with correspondence which had passed between the General Secretary of the N.V.M.A. and the Secretary of the Scottish Branch, was considered by the Council, and that body recommended " that the Scottish

* Received on 15th March, 1928.

Metropolitan Division should support the resolution and that its members might offer their services to the local branches of the S.S.P.C.A. to treat animals belonging to deserving persons of the poorer class at a reduced scale of fees, and that a press notice should be issued accordingly."

After discussion by various members, Mr. A. SPRUELL proposed that the recommendation be supported, and Dr. O. CHARNOCK BRADLEY seconded. The motion was carried unanimously.

The PRESIDENT intimated that a letter had been received in which Mr. Robert Reid, of Cupar, Fife, found that owing to ill-health he must tender his resignation from the Division. The Council recommended that Mr. Reid's resignation be accepted with great regret. To this the meeting agreed.

*Secretary's Report.* The SECRETARY briefly reported that the number of members was 64, the number of resignations during the past year was six, and the number of new members was 12. Income for the year, including certain subscriptions in arrear, was £35 8s. 9d., expenditure was £24 19s. 6d., leaving a balance in hand of £10 9s. 3d.

The PRESIDENT said that he thought the report would be considered satisfactory, and moved that it be adopted, and the Secretary be thanked for his services during the year. This was carried with enthusiasm.

ELECTION OF OFFICE-BEARERS FOR 1928.

*President.* It was proposed by Mr. T. M. INGLIS that Professor Linton be re-elected for a further session, and Mr. P. WILSON seconded. There being no other nomination Professor Linton was elected amid acclamation. He briefly thanked the members of the Division for his re-election.

*Vice-Presidents* (3). Mr. J. TAYLOR proposed that Dr. O. Charnock Bradley, Messrs. W. Wallace Peggie and T. M. Inglis be elected Vice-Presidents. Professor MITCHELL seconded and these gentlemen were duly elected.

*Members of Council* (4). Messrs. J. Taylor, A. Gofton, S. Robson, and J. Aitken were proposed as Councilmen by Mr. WM. ANDERSON, seconded by Mr. P. WILSON, and declared duly elected.

*Auditors* (2). On the motion of the PRESIDENT, seconded by Mr. JAS. HENDERSON, Messrs. Taylor and Robson were re-elected as Auditors.

*Secretary-Treasurer.* The PRESIDENT proposed that Mr. Miller be re-elected to this joint office, and to this the meeting agreed.

*Representatives to the Council of the N.V.M.A.* The PRESIDENT announced that two representatives were due to be elected to take office from the termination of the Annual Congress in 1928 until the termination of the Annual Congress in 1929. He proposed that Dr. O. Charnock Bradley and Mr. T. M. Inglis be elected. Mr. J. TAYLOR seconded, and these gentlemen were duly elected.

*Election of New Members.* The President read the list of those gentlemen who were nominated at the last meeting for membership as follows: Major R. G. Anderson, Kirkcaldy; Mr. J. G. McGregor, Stirling; Mr. Chas. Weighton, Forfar. Dr. O. CHARNOCK BRADLEY proposed that these gentlemen be elected. Mr. T. M. INGLIS seconded, and they were declared duly elected.

*Nominations for Membership.* Mr. Esmond Brown, Divisional Inspector of the Ministry of Agriculture, and Mr. A. Larnach, Musselburgh, were nominated for membership. Major Graham-Williamson, of the R.A.V.C., and Dr. H. Dryerre were nominated for election as *Honorary Members.*

*President's Motion.* The PRESIDENT announced that it had been decided in Council that it was desirable to recommend that the Rules and Bye-Laws be revised and brought up to date. He moved, accordingly, that a small Sub-Committee be appointed to revise and re-draft such Rules and Bye-Laws as might be necessary, and that its report and recommendations should be submitted to the Council for consideration. This was agreed, the Sub-Committee to be appointed from among the members of the Council.

The next business was the demonstration of a number of specimens which had been exhibited in another room previous to the meeting. [Full reports of these exhibits appear in our Clinical and Case Reports Section this week. —Ed.].

At the termination of the demonstrations the PRESIDENT moved from the Chair that to those who had taken part a very hearty vote of thanks be accorded. This was carried unanimously.

Mr. J. TAYLOR proposed a vote of thanks to the President for his able conduct of the meeting. This was heartily accorded.

WM. C. MILLER,
*Hon. Secretary.*

## Western Counties' Division.*

ANNUAL MEETING AT EXETER.

The 44th Annual General Meeting of the Western Counties' Division was held at the Royal Clarence Hotel, Exeter, on March 22nd. The President (Mr. S. J. Motton, Penzance) presided, and at the outset extended a hearty welcome to Miss A. Cust, of Romsey, who, he said, was the first qualified lady veterinary surgeon to attend a meeting of the Division. The members present were Messrs. W. Ascott, W. G. Blackwell, R. W. Cassels, E. R. Edwards, W. Fyrth, G. H. Gibbings, J. K. Irvine, G. D. Lansley, J.P., C. Masson, W. B. Nelder, E. J. L. Norman, J. M. L. Penhale, R. E. L. Penhale, W. Roach, H. K. Roberts, E. J. Thorburn, W. N. Wright, and the Hon. Secretary and Treasurer (Mr. Barons Nelder).

Apologies for absence were received from Principal Hobday, Messrs. E. C. Bovett, E. W. Bovett, C. Crowhurst, J. Dunstan, R. Ferris, W. J. Radford, A. G. Saunders, W. C. Smith, E. R. Smythe, and R. H. Smythe.

The minutes of the last meeting, as published in the *Veterinary Record*, were taken as read, and were confirmed and signed as correct.

*Correspondence.* (1) The Hon. Secretary, having read a letter from Mr. P. W. Bloye, Plymouth, resigning his membership, said he had written several letters to Mr. Bloye asking him to reconsider his decision, but without success. On the proposal of Mr. Edwards, seconded by Mr. Ascott, the meeting accepted the resignation with

* Received on 28th March.

regret, and the hope that Mr. Bloye would reconsider his decision at a later date.

(2) A letter was read from Dr. A. L. Sheather, thanking the Division for supporting his request for registration under the Vivisection Act and stating that he had been successful.

(3) The HON. SECRETARY reported that at the last meeting attention was called to a letter in a local newspaper appealing to the general public for help in equipping a people's dispensary for sick animals at Exeter. Some members were of opinion that people thought the dispensary was under the supervision of a qualified veterinary surgeon, and it was suggested that an explanatory letter might be sent to the Press. As it was a matter calling for careful handling, he forwarded the facts to the National Association who, after careful consideration, sent a letter for issue to the Press. The letter was sent to the local papers and was published. Replying to a question, the Hon. Secretary said there had been no further development.

(4) A letter was read from the Secretary of the R.C.V.S. regretting there had been unavoidable delay in considering the question of the inspection of animals at Plymouth dog shows mentioned at the last meeting of the Division, and asking Mr. Nelder to forward the papers again for consideration at the next meeting. Mr. Nelder, however, read a letter from the Royal College and published in a Plymouth newspaper, to the effect that the inspections had not been carried out by a qualified veterinary surgeon.

*Election of New Members.* Mr. W. J. Radford, M.R.C.V.S., Plymouth and Mr. J. C. Stephens, M.R.C.V.S., Tregoney, were elected to membership of the Division.

*Hon. Secretary's Report and Financial Statement.*

In his annual report, the HON. SECRETARY and TREASURER stated that during the year there had been three meetings of members and two Council meetings. The Division's activities had been somewhat restricted by the annual congress of the parent body being held in their area, and, in consequence, the summer meeting was only of a business character. The arrangements for the congress entailed a good deal of attention by the Provincial and Executive Committees, but they were amply repaid by the good attendance and excellent discussions on all the papers. Mr. Motton was present throughout the congress and his contribution on "Lightning and Electric Shock" was much appreciated. The autumn meeting at Plymouth was well attended and an excellent address on "Foot-and-Mouth Disease" was given by Mr. J. M. L. Penhale, while the spring meeting was given over to clinical items. It was hoped members would bring forward more clinical cases and specimens; there was never a surfeit in that direction. Four new members had been admitted, but they had lost, through death, Mr. W. Penhale, one of the founders of the Division, who was very regular in his attendance at their meetings and who was sadly missed; Mr. J. R. Conchie, and Prof. Penberthy, their oldest hon. associate. The Division were indebted to Mr. Masson for his work on the council and committees of the N.V.M.A.

Regarding the accounts, receipts were the same as in the previous year, but the expenditure was a little heavier. If £5 were placed on deposit, there would be a balance of £5 1s. 6d. to be carried forward. Only one member had failed to pay his subscription.

Moving the adoption of the report and accounts, and that £5 be placed on deposit, the Hon. Secretary thanked Mr. Edwards for auditing the accounts and for his helpful suggestions. Mr. R. E. L. PENHALE seconded and the motion was carried. Mr. Gibbings raised the question of the omission from the accounts of the Hon. Secretary's expenses in attending London meetings on behalf of the Division, and suggested that he should be reimbursed. Mr. Nelder explained that he did not go to London solely on the Division's business, but in spite of his protest, it was decided, on the proposal of Mr. EDWARDS, seconded by Mr. WRIGHT, that Mr. Nelder should be made a grant of £5 5s. towards his expenses.

ELECTION OF OFFICERS.

The meeting then proceeded to the election of officers. On the proposal of the CHAIRMAN, seconded by Mr. NORMAN, Mr. H. K. Roberts was elected *President* and Messrs. F. T. Harvey, S. J. Motton, E. W. Bovett and W. N. Wright—*Vice-Presidents.* The CHAIRMAN, proposing the re-election of Mr. R. B. Nelder as *Hon. Secretary and Treasurer*, said that in Mr. Nelder the Division had a most efficient and very enthusiastic officer, who was a tremendous help to the President. Mr. ASCOTT seconding, said that, as one of the old Hon. Secretaries, he knew the enormous amount of work that Mr. Nelder had done. It was a labour of love. The duties were being more efficiently discharged than they had been for a great number of years. The motion was unanimously carried. On the proposal of the CHAIRMAN, seconded by the HON. SECRETARY, Mr. E. J. L. Norman was elected *Assistant Hon. Secretary* (a new appointment); Mr. Edwards was re-elected *Hon. Auditor*, and other appointments were: *Council*—Messrs. Edwards, Masson, J. M. L. Penhale, Wright, and (*ex-officio*) the President and Hon. Secretaries; *Representatives on the Council of the N. V.M. A.*—The President and Hon. Secretary and Mr. Motton.

*Place of Next Meeting.*

The Hon. Secretary having pointed out that the Division had not visited Cornwall or Somerset for nearly two years, it was decided to hold the next meeting at Truro, and it was suggested that the following meeting might be held in Somerset.

*Branch Meetings.*

Discussion took place on the question of holding meetings of the branches of the N.V.M.A. The HON. SECRETARY intimated that the matter had been discussed by one of the committees of the "National" for a very long time without, apparently, any definite decision having been arrived at. The difficulty would be in getting a representative meeting of the Southern Branch, which covered a large and widely-scattered area. He did not think the Division could forgo any of their three meetings.

Mr. MASSON said that in the Midlands and Scotland, branch meetings had been a great success. It was felt by the "National" that if branches once functioned the meetings would be successful. The idea was to call a meeting of the Southern Branch to appoint a President, and then to see what could be done.

Mr. ASCOTT reminded the meeting that the Sanitary Congress was to be held at Plymouth in July, and he moved

that the Hon. Secretary be asked to write Mr. Male suggesting that a branch meeting might be held on the Thursday on which the Veterinary Hygiene Section met. Mr. MASSON seconded, and the motion was carried.

### POST-MORTEM SPECIMENS.

There were two specimens for the inspection of members. One was the bladder of a cow, showing three new growths. It was forwarded by Mr. R. H. Smythe, Camborne, who wrote that one of the pedunculated growths was completely detached. The subject was a cross-bred Guernsey, accepted six weeks before death for insurance, being then in very good condition and due to calve in a fortnight. She commenced to pass blood-stained urine and, later, clean blood, which accumulated behind her in clots. She rapidly became emaciated and died in just over three weeks from the first appearance of hæmaturia.

Mr. WRIGHT exhibited a curious specimen. He explained that he was called to see a bull bitch, two years old. It seemed to have no tail, but he found that the tail had grown into the muscle by the side of the rectum. It was impossible to pull it out or to get at it. Inside was a very large abscess.

### DISCUSSION ON SWINE FEVER.

The name of Mr. E. R. EDWARDS, F.R.C.V.S., Exeter, appeared on the agenda to open a discussion on "Swine Fever," but members found his observations more informative than provocative. He was fortunate in having on loan from the Ministry of Agriculture a number of extremely interesting preserved and fresh specimens of the disease, and also of swine erysipelas.

Mr. Edwards explained that the first authentic mention of swine fever in Great Britain was in a paper by Dr. Budd, of Clifton, read before the Royal Agricultural Society in 1865, and there was no doubt that the disease which Dr. Budd spoke about was the disease which we knew as swine fever to-day in this country. According to Dr. Budd, the disease was well known to pig dealers in Bristol many years before. Professor Simonds referred to a virulent outbreak in Berkshire in 1862, and that tended to confirm Dr. Budd's statement that it was known before 1865. The late Sir Geo. Brown, veterinary advisor to the Veterinary Department of the Privy Council—which existed before the Ministry of Agriculture—stated that the disease was prevalent in Wiltshire and Berkshire in 1864. That was about all that could be said about its earlier history. There were earlier references to a disease, variously called "red disease," "pig cholera" and other names, but it was not certain that it was swine fever as it was known to-day. As to pathology, he need not go into the symptoms, but one interesting feature—not always recognised but well worth remembering—was that the blood of a pig suffering from swine fever was virulent. The disease was due to a filter-passing virus and not, as was taught until comparatively recently, to a visible, actively motile, bacillus. Intestinal lesions were the only indications accepted by the Ministry as indicative of swine fever, but there were other conditions that should always create a suspicion in the minds of everyone called upon to deal with illness in pigs. Most prominent was pneumonia. Pigs got pneumonia apart from swine fever, but where there were a number of pigs running together in a straw yard and showing pneumonic symptoms, including a peculiar sort of moist cough, they should be suspicious. If they made *post-mortem* examinations in such cases, they would frequently find in the lungs grey necrotic areas, quite small, and perhaps no bigger than a grain of wheat squeezed flat, but easily picked out on the point of a knife. Gastro-enteritis was another symptom and it was quite common in the early stages of swine fever. Diagnosis between swine fever and swine erysipelas was not always easy. Erysipelas was more likely to be confused with swine fever than any other disease. In both there were blotchy discolourations of the skin, gastro-enteritis, enlarged glands and other lesions, but there was something about an ailing pig which told anyone with experience whether it was swine fever or swine erysipelas, that would be found on opening up.

Mr. Edwards expressed his indebtedness for the loan of the specimens to Mr. Jackson, Chief Veterinary Officer of the Ministry, and to Dr. Andrews of the Laboratory Department.

Mr. J. M. L. PENHALE said that the disease most likely to be confused with swine fever was swine erysipelas, which was often reported as suspected swine fever. The two exhibited specimens of swine erysipelas, showing the "furry" deposit, illustrated a condition frequently met with in this disease. Outbreaks of swine fever varied considerably in virulence, but his experience in the West was that the majority of the cases were not of the acute type. In 1927 there were just over 50 outbreaks in Devon and Cornwall.

Replying to Mr. Blackwell, Mr. EDWARDS said that "rambling" in pigs was indicative of weakness and they got weakness with almost every illness. There was, however, something about the gait of a pig in the later stages of swine fever which made one more suspicious than otherwise, but because a pig was rambling it could not be said that it had swine fever. It might be due to a variety of causes. If a number of pigs were like it, it would certainly increase the suspicion.

Mr. GIBBINGS said that 90 per cent. of the deaths were due to pneumonia or gastro-enteritis and, as it was almost impossible to say whether that was associated with swine fever, he thought the only thing a surgeon could do was to say that he was uncertain. It was rare for the Ministry to condemn a pig for swine fever that was suffering from gastric trouble.

Mr. GIBBINGS: How is it that we get so much swine fever in pigs fed on swill from public institutions?

Mr. EDWARDS: I do not know and I question whether anyone else knows. You quite frequently get swine fever in pigs kept at institutions. I do not know what is the explanation.

On the proposal of the CHAIRMAN, seconded by Mr. BLACKWELL, a hearty vote of thanks was accorded Mr. Edwards and also the Ministry for the loan of the specimens, while a similar vote was accorded Mr. Motton for his services as President.

Mr. MOTTON thanked the members and, at his suggestion, it was decided to send a letter to Mr. J. Dunstan expressing sympathy in his illness and wishing him a speedy recovery.

R. BARONS NELDER,
*Hon. Secretary.*

# NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

## Diary of Events.

April 11th—N.V.M.A. Council and Committee Meetings.
April 11th—Committee Meetings, R.C.V.S.
April 12th—Ditto.
Meeting of the Central Division at the Royal Veterinary College, Camden Town.
April 13th—Committee and Council Meetings, R.C.V.S.
April 16th—Meeting of the Editorial Committee, N.V.M.A., 4-30 p.m.
April 20th—Meeting of the Lancashire Division, at Liverpool.
April 25th—Meeting of the Scottish Metropolitan Division at Edinburgh.
May 10th—Nominations for Election to Council, R.C.V.S.
May 24th—R.C.V.S. Voting Papers and Annual Reports issued.
Entries due for D.V.S.M. Examination.
May 30th—R.C.V.S. Voting Papers to be returned.
June 7th—Annual General Meeting, R.C.V.S., 12 noon, at 10 Red Lion Square.

## N.V.M.A. Clinical Prize Scheme for Students.

The attention of all students attending the Veterinary Colleges is drawn to the regulations governing the above scheme, which will be found on the notice boards of their respective Colleges. It is hoped that all those eligible to compete will do so, and that they will not fail to take the opportunity for note-taking afforded by the Easter vacation.

## R.C.V.S. Fellowship Diploma.

An examination for the Diploma of Fellow was held at 10 Red Lion Square, London, W.C.1, on Wednesday, March 28th, 1928, when the following candidate was successful:—

*John George Wright.*

Thesis entitled: "Canine Obstetrics."

Examiners: Professor James Macqueen, F.R.C.V.S., Professor J. J. O'Connor, M.R.C.V.S.

Chairman: Professor J. B. Buxton, M.A., F.R.C.V.S., D.V.H.

## Obituary.

### Mr. Archibald McCunn, M.R.C.V.S.

We regret to record the death, at the early age of 44 years, of Mr. Archibald McCunn, M.R.C.V.S., of 1 Church Street, West Ham. The tragic suddenness of the sad event will come as a shock to his many friends within and outside the profession, occurring as it did on Sunday, March 25th, from lobar pneumonia, after an illness of only three days' duration.

Mr. McCunn had been suffering from a cold and visited a case at Woolwich on the Thursday. On his return he took to his bed, but, despite unremitting care and attention, death occurred.

The late Mr. McCunn was a Scotsman, receiving his professional training in Glasgow, where he distinguished himself and gained many special awards. Graduating in May, 1906, he became assistant to Professor Imrie. In the following year he succeeded to the practice of the late Mr. Young at 1 Church Street, West Ham. It is a coincidence that Mr. Young died under similar circumstances.

Mr. McCunn had held the appointment of Veterinary Surgeon to the West Ham Corporation for many years. He also held appointments under the Ministry of Agriculture and for many Shipping Companies. In connection with the export of pedigree stock to the Argentine and British Colonies, the deceased gentleman did a great deal of work. He was a Freemason, being a prominent member of the Bishop of Barking Lodge. All his professional life he was much interested in the breeding of Bulldogs, being a member of a number of clubs in connection therewith, and his animals carrying off a great many prizes.

We understand that the practice will be continued under the supervision of Mr. McCunn's brother, who holds the position of Professor of Anatomy at the Royal Veterinary College, Camden Town. At a meeting of the West Ham Town Council, on Tuesday evening, a vote of condolence with Mr. McCunn's family was passed.

The interment took place, on Thursday of last week, in the family grave at Chingford Parish Church, preceded by a service conducted by the Rev. Knight. A large number of friends assembled to pay a tribute of respect, including many of the deceased's professional colleagues. Among a large number of floral tributes were those from local Government officials, shipping companies, fellow veterinarians, the West Ham Police and the employees of several of Mr. McCunn's contract firms.

## Dairies and Cowsheds Order.

An important provision for the sanitary improvement of cowsheds and dairies came into force on Monday, in Order No. 821, made by the Minister of Health under the Milk and Dairies (Consolidation) Act, 1915. Where the sanitary authority has served the statutory 18 months' notice to the occupier, the farmer and dairyman must provide cowsheds and every other building used for the keeping of milk, with a sufficient number of windows or suitable openings so placed as to face the external air; while, where milking takes place, such buildings must be provided with artificial illumination to enable the process to be carried on in good and proper light. All registered premises must be provided with suitable and efficient water supply, and the floors of cowsheds must be of rendered concrete or other impervious material, efficiently channelled and leading to a drain outside.

## Inter-Collegiate Rugby.

### Edinburgh Students' Success in London

The annual match between the Royal (Dick) College, Edinburgh, and the Royal Veterinary College, London, was played on the morning of Saturday, March 17th, at Osterley Park, a fast and closely contested encounter being thoroughly enjoyed by players and spectators alike. Edinburgh won the toss and London kicked off with the wind. Play was even until, after about twenty minutes, Edinburgh attacked strongly, and after a good three-quarter movement McLaren scored for Edinburgh in the corner. Irwin's kick failed. London now played up strongly and for some time play was confined to the Edinburgh "25," but a free kick against London relieved the pressure. Half-time arrived with Edinburgh leading by three points scored thus far. Play deteriorated for a period after the interval, being scrappy and confined to mid-field, London losing several chances by dropped passes. A strong forward rush by Edinburgh took the play to the London "25," where another try was scored by Robinson after a good bout of passing. McLaren failed to convert. After

this the play was level until the final whistle left Edinburgh well-deserved victors by two tries to nil (6-0).

The teams were :—

*London.* M. H. Clarke ; J. H. N. Hobday, J. D. Peele, A. B. Over, G. H. Harvey ; E. V. Ince, T. A. R. Filgate (Capt.) ; J. A. Nicholson, K. H. Everett, P. Norrington, H. J. Sadler, A. Messervy, B. G. Catmur, N. R. Reid, and N. Lamb.

*Edinburgh.* S. Simpson ; G. G. McLaren, W. G. Robinson, G. Gibson, A. M. Urquhart ; A. S. Prentice (Capt.), G. Oliver ; H. R. Irwin, J. G. Speed, J. Anderson, A. Mather, E. G. Wood, T. B. L. Muir, A. P. Steele, and S. Jennings.

*Referee :* Prof. Graham, of Edinburgh.

The Edinburgh team arrived at King's Cross at 8 a.m., and after breakfast at the Great Northern Hotel they were taken to the College, where a 'bus took the two teams to Osterley. After lunch at the ground, following the match, the rivals repaired to the Twickenham enclosure, where everyone enjoyed the international game, the Londoners especially rejoicing at the reversal of the morning's decision. The 'bus then conveyed the party to the Rendezvous Restaurant, where dinner was served, with Principal Hobday in the chair. Toasts were drunk, speeches made, and some songs sung, and at 10-30 the company adjourned to King's Cross. The Edinburgh party left at 11-30, after extending a cordial invitation to London to retrieve their defeat in Edinburgh next year.

### The Diseases of Animals (Disinfection) Order of 1926.

The Ministry of Agriculture desires to make it known as widely as possible that every disinfectant approved for the purposes of the above Order bears a label citing the Minister's approval and the date thereof, together with the dilution at which the disinfectant is to be used for the purposes of the Diseases of Animals Orders. This label, which is required to appear upon every receptacle in which an approved disinfectant is sold to the public, is required to be in the following terms :—

(*Title of Disinfectant.*)

" This preparation has been approved by the Minister of Agriculture and Fisheries for the purposes of the Diseases of Animals Act and Orders of the Minister thereunder for use in the proportion of one part of this preparation to parts of water.

" The contents of this receptacle are hereby guaranteed to be of the same quality and composition as the sample which was submitted to, and examined by, the Government Chemist, upon which the approval of the Minister of Agriculture and Fisheries dated is based."

The use, for the purposes of the Diseases of Animals Acts and Orders, of any disinfectant other than a five per cent. solution of standard phenol, or a disinfectant approved by the Minister, constitutes an offence against the Diseases of Animals Act, 1894. The Ministry has compiled a list of approved disinfectants, a copy of which may be obtained by any retailer of disinfectants upon application to the Secretary, Ministry of Agriculture and Fisheries, Whitehall Place, London, S.W.1.

### The Royal Sanitary Institute Congress.

The programme for the 39th Congress of the Institute, which is to be held at Plymouth by invitation of the Town Council, from July 16th-21st, 1928, is well advanced. The Local Committee, presided over by the Right Worshipful the Mayor, has in hand arrangements for receiving and entertaining the Delegates and Members. Already some 500 delegates have been appointed by the Admiralty, the Air Ministry, Welsh Board of Health of the Ministry of Health, the Ministry of Home Affairs for Northern Ireland, the War Office, and 300 Sanitary Authorities, Societies and Universities in all parts of Great Britain, and representatives will be attending from Denmark, the United States of America, the Irish Free State Department of Local Government and Public Health, the Commonwealth of Australia, South Australia, Calcutta, the Colonial Government of Hong Kong, King William's Town (South Africa), Rathmines and Rathgar Urban District Council (Irish Free State), University College (Dublin), and John Hopkins University (Baltimore).

The Reception Room will be arranged in St. Andrew's Hall, and the principal meetings of the Congress will be held in the Guildhall, Law Courts, and Council Chamber, Municipal Buildings.

The Health Exhibition, illustrating Municipal and Domestic Hygiene, Appliances for Houses and General Sanitation and matter relating to Physical Welfare, will be accommodated in the Drill Hall, which is centrally situated close to Millbay Station.

Following are the Officers of Section G., Veterinary Hygiene :—

*President.*—Major F. T. G. Hobday, C.M.G., F.R.C.V.S., F.R.S.E., Principal of the Royal Veterinary College, London.

*Recording Secretary.*—James R. Hayhurst, M.R.C.V.S., D.V.S.M., Superintendent and Chief Veterinary Inspector, Metropolitan Cattle Market, Islington.

*Hon. Local Secretaries.*—John Thorning, Meat Inspector, Wholesale Meat Market, Plymouth ; R. E. Blundell, 9 Argyle Terrace, Plymouth.

Among the subjects on which discussions are being arranged for in Sections and Conferences are :—

The Present Position of the Tuberculosis Problem.

The Slaughtering of Animals.

Animal Parasites commonly met with in relation to Meat Inspection.

Milk.

Ultra-violet Therapy Treatment.

Construction of Modern Abattoirs.

### Rabies in Dog from India.

A case of rabies has been confirmed in a dog recently landed from India and put in quarantine, according to the regulations. Several other dogs landed from the same boat are under observation.

## CORRESPONDENCE.

### Tartar Emetic in Nagana.

To the Editor of The Veterinary Record.

Sir,—Mr. H. E. Hornby's interesting investigation in regard to the toxicity of tartar emetic, as recorded in your issue of January 21st, confirms the opinion that, in the treatment of patients with intravenous antimony both in Natal and in Egypt, it is best to use the potassium salt freshly dissolved in small doses of saline given repeatedly in doses large enough to destroy the blood-parasites, but too small to cause permanent damage to the system. His report suggests that the very large doses that are generally employed in dealing with nagana might be substituted by more moderate ones given a little more frequently, thus falling into line with the methods adopted in treating human diseases. Intravenous antimony injections are facilitated by the use of tablets containing tartar emetic and sodium chloride in combination, which any reliable druggist could prepare for veterinary use, as is already done in medicine.—Yours faithfully, F. G. Cawston, M.D. Cantab.

16 Britannia Buildings,
West Street,
Durban,
13*th March*, 1928.

*The Editor acknowledges the receipt of the following* :—

Report of a meeting of the Lancashire Division from Mr. J. Spruell, Hon. Secretary.

Communications from Mr. D. J. Anthony, Major T. Dalling, Dr. T. Hare, Messrs. O. Stinson, E Wardrop, and G. W. Weir.